

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended): A storage platform system including a processor and a computer readable storage medium for a hardware/software interface system implemented at least in part by a computing device, said storage system comprising:

instructions for an operating system, the operating system including a kernel, wherein the kernel includes a database management program integrated with a file system, the database management program integrated with the file system configured to store data in the file system as file streams, generate items that include metadata for the file streams and store the items in the database management program, the database management program multiple instances of a storage platform each instance storing data, each instance of the storage platform including a base schema and a mechanism configured to extend the base schema to define a schema for the data, and divide the data into programmably defined change units based on the schema for the data, wherein a change unit is a smallest piece of schema that is individually tracked by the database management program integrated with the file system each instance of the storage platform and the size of a change unit is adjustable; and

the operating system further including a synchronization subsystem configured native to the hardware/software interface system that enables the system to perform a synchronization operation to synchronize the data stored in the database management program integrated with the file system with a remote computer multiple instances of said storage platform based on changes that are sequentially enumerated and tracked on a per change unit basis.

2. (Original): The system of claim 1 wherein the synchronization subsystem synchronizes only a subset of data, from among the entirety of data on said data store, during a synchronization operation.

3. (Currently amended): The system of claim 1 wherein instructions that effectuate the database management program integrated with the file system are configured to execute during kernel mode wherein a first instance of the storage platform is a replica running on a hardware/software interface system that has the synchronization subsystem, and a second instance of the storage platform is a data source running on a hardware/software interface system that does not have the synchronization subsystem.

4. (Currently amended): The system of claim 3 wherein the operating system further includes an application program interface that is configured to execute during kernel mode, wherein the application program interface is configured to expose the items stored in the database management program to applications executing in user mode of the operating system wherein the synchronization between the replica and the data source is facilitated by a synchronization adapter that virtualizes the data source by interfacing with an application programming interface of the hardware/software interface system of the replica.

5. (Currently amended): The system of claim 1 wherein the synchronization subsystem is configured to a first pair of instances synchronize[[s]] changes independent[[ly]] of the remote computer system of a second pair of instances, and wherein both the first pair of instances and the second pair of instances are part of a common sync community.

6. (Original): The system of claim 1 wherein conflicts in synchronization are automatically detected and resolved based on predefined determinable criteria.

7. (Original): The system of claim 6 wherein certain of said conflicts are resolved by being logged for manual resolution by an end-user.

8. (Previously presented): The system of claim 1 wherein the synchronization subsystem tracks the state of previous synchronizations with a sync partner, and thereby only synchronizes change units with that partner that have changed since the last synchronization.

9. (Currently amended): A ~~method implemented at least in part by a computing device for synchronizing data stored in a computer system in multiple instances of a storage platform for a hardware/software interface systems~~, said method comprising:

executing an operating system that includes a kernel, the kernel including a database management program integrated with a file system, wherein the database management program includes storing a base schema and a mechanism to extend the base schema to define a schema for data;

storing, by the database management program integrated with the file system, data in the file system as file streams;

generating, by the database management program integrated with the file system, items that include metadata for the file streams, wherein the metadata is defined by the schema for the data;

storing the items in the database management program;

dividing, by the database management program integrated with the file system, said data stored in a storage platform into programmably defined change units based on the schema for the data, wherein a change unit is a smallest piece of schema that is individually tracked by the database management program integrated with the file system each instance of the storage platform and the size of a change unit is adjustable;

sequentially, by the database management program integrated with the file system, enumerating changes to said data and tracking said changes on a per change unit basis;

tracking, by the database management program integrated with the file system, for each instance of said storage platform, tracking the state of changes to the database management program for that instance, as well as the state of changes to a remote computer system for a plurality of other known instances in the [a] sync community; and

for synchronization, identifying new changes by comparing the enumerated changes to said data to the changes of the remote computer system for a particular instance with the state of changes for that instance.

10. (Currently amended): The method of claim 9, wherein code that effectuates the database management program integrated with the file system is configured to execute during kernel mode of the operating system ~~a first instance, a replica, is instantiated on a hardware/software interface system that directly supports Item-based synchronization and wherein a second instance, a data source, is instantiated on a hardware/software interface system that does not directly support Item-based synchronization, said method further comprising the use of an adapter to virtualize the second instance via a synchronization application programming interface.~~

11 (Original): The method of claim 10 further comprising detecting synchronization conflicts at the level of change unit granularity.

12. (Previously presented): The method of claim 10, further comprising:
instances reporting success, failure, and/or conflicts at individual change unit level on change application, the instances comprising sync data; and
applications using sync data for updating a backend state.

13. (Currently amended): A method ~~implemented at least in part by a computing device for synchronizing data a replica with a data source, each being a sync partner, wherein both said replica and said data source have change state information that is maintained by each sync partner, and wherein said data source uses an adapter to interface with a hardware/software interface system of said replica, said method comprising:~~

executing an operating system that includes a kernel, the kernel including a database management program integrated with a file system;

storing, by the database management program integrated with the file system, data in the file system as file streams;

generating, by the database management program integrated with the file system, items associated with the file streams that include metadata for the file streams, wherein the metadata is defined by the schema for the data, further wherein the items conform to a schema derived from a base schema, the schema defining a size of a change unit, further wherein a change unit is the smallest piece of schema that is individually tracked by the database management program integrated with the file system;

storing the items in the database management program;
receiving, by an application program interface exposed to a shell of the operating system ~~said replica sending to said adapter an updated state information for [[said]] a replica remote computer system that, based on a last state information for said data source,~~ reflects new changes that have been made to a change unit of an item since the last synchronization as reflected in ~~said last state information for said data source,~~ wherein data in the data source includes multiple types of data and each type of data conforms to a schema that defines a size of a change unit, the change unit being a smallest piece of schema that is individually tracked by the data store, and the size of each change unit in each schema is adjustable; [[and]]
~~said adapter, receiving said updated state information for said replica and said new changes,~~
applying a conflict resolution policy selected from a plurality of conflict resolution policies[[,]];
modifying, by the database management program integrated with the file system, the item in accordance with the new changes that have been made to the change unit of the item and a conflict resolution policy selected from the plurality of conflict resolution policies;
~~implementing as many changes to the data source as possible with respect to the specified conflict resolution policy and~~
tracking success or failure for each change on a change unit by change unit basis, wherein changes are sequentially enumerated and tracked on a per change unit basis[[.]] and
storing, by the database management program integrated with the file system, data that reflects the new changes in the file system as file streams.

14. (Currently amended): The method of claim 13, further comprising:

~~said adapter~~ calculating [[the]] a new state of the information stored in the database management program data source based on the success or failure for each change on a change unit by change unit basis, storing [[this]] the new state information, and transmitting [[this]] the new state information to the remote computer system hardware/software interface system of the replica; and

~~said hardware/software interface system of the replica storing said new state information for said data source for future use by said replica.~~

15. (Currently amended): The method of claim 13, further comprising:
~~said adapter transmitting to the remote computer system hardware/software interface system of the replica the success or failure for each change on a change unit by change unit basis;~~
~~said hardware/software interface system of the replica calculating a new state information for the data source based on the success or failure for each change to the data source on a change unit by change unit basis;~~
~~receiving said hardware/software interface system of the replica transmitting the new state information that reflects whether each change was successful from the remote computer system to the adapter and storing said new state information for future use by said replica;~~
and
~~said adapter receiving and storing, by the database management program integrated with the file system, said new state information.~~

16. (Currently amended): A computer-readable storage medium comprising
computer-readable instructions for a storage platform system, the computer readable storage medium comprising:
instructions for an operating system, the operating system including a kernel and a shell, wherein applications execute on the shell of the operating system;
the instructions for the operating system including a database management program integrated with a file system, wherein the database management program integrated with the file system is part of the kernel of the operating system;
the instructions for the database management program integrated with the file system configured to store data as file streams in the file system and generate items for the file streams that include metadata for the file streams, wherein the format of the metadata conforms to one of a plurality of schemas, each schema of the plurality is derived from a base schema, further wherein each schema of the plurality includes ~~on a hardware/software interface system, said storage platform system comprising instructions for synchronizing a local instance from among multiple instances of a storage platform, the data conforming to one or more schemas and divided into programmably defined change units based on the one or more schemas, wherein a change unit is a smallest piece of schema that is individually~~

~~tracked by the database management program integrated with the file system; by each instance of the storage platform and the size of a change unit in each schema is adjustable, and the change units based on changes that are sequentially enumerated and tracked on a per change unit basis~~

the instructions for database management program integrated with the file system including instructions for a synchronizing process, wherein the synchronizing process is configured to track changes to the items on a per change unit basis;

the instructions for the operating system further including an application program interface configured to expose tracked changes to the items to the shell of the operating system, wherein the application program interface is configured to execute in kernel mode.

17. (Currently amended): The computer-readable storage medium of claim 16, further comprising:

instructions for transmitting changes to the items to a remote computer system ~~wherein the synchronization subsystem synchronizes only a subset of data, from among the entirety of data on said data store, during a synchronization operation.~~

18. (Currently amended): The computer-readable storage medium of claim 16, wherein the instructions for the database management program integrated with the file system are configured to execute during kernel mode of the operating system ~~wherein a first instance of the storage platform is a replica, that is, running on a hardware/software interface system that has the synchronization subsystem, and a second instance of the storage platform is a data source, that is, running on a hardware/software interface system that does not have the synchronization subsystem.~~

19. (Currently amended): The computer-readable storage medium of claim ~~[[18]]~~ 16, wherein the instructions for the operating shell include instructions for receiving changes to items from a remote computer system; and

the instructions for the shell configured to transmit changes to items to the application program interface ~~synchronization between the replica and the data source is facilitated by a~~

~~synchronization adapter that virtualizes the second instance by interfacing with an application programming interface of the hardware/software interface system of the first instance.~~

20. (Previously presented): The computer-readable storage medium of claim 16, ~~wherein the instructions for the synchronization process are configured to wherein a first pair of instances synchronize[[s]] changes independent[[ly]] of a remote computer system second pair of instances, and wherein both the first pair of instances and the second pair of instances are part of a common sync community.~~

21. (Previously presented): The computer-readable storage medium of claim 16, wherein conflicts in synchronization are automatically detected and resolved based on predefined determinable criteria.

22. (Previously presented): The computer-readable-storage medium of claim 21, wherein certain of said conflicts are resolved by being logged for manual resolution by an end-user.

23. (Currently amended): The computer-readable storage medium of claim 16, wherein the synchronization process is configured to subsystem track[[s]] the state of previous synchronizations with a sync partner, and thereby only synchronizes change units with that partner that have changed since the last synchronization.

24. (Currently amended): A computer-readable storage medium comprising computer-readable instructions for synchronizing data ~~stored in multiple instances of a storage platform for a hardware/software interface systems~~, said computer-readable storage medium instructions comprising instructions for:

instructions for executing an operating system that include instructions for a kernel, the instructions for the kernel including instructions for a file system integrated with a database management program, wherein the instructions for the database management program include instructions for storing a base schema and a mechanism to extend the base schema to define a schema for data;

the instructions for the kernel of the operating system including instructions for storing data in the file system as file streams;

the instructions for the kernel of the operating system including instructions for generating items that include metadata for the file streams, wherein the metadata is defined by the schema for the data;

the instructions for the kernel of the operating system including instructions for instructions for storing the items in the database management program;

the instructions for the kernel of the operating system including instructions for dividing said data stored in said storage platform into programmably defined change units based on the schema for the data, wherein a change unit is a smallest piece of schema that is individually tracked by the database management program integrated with the file system each instance of the storage platform and the size of a change unit is adjustable;

the instructions for the database management program including instructions for sequentially enumerating changes to said data and tracking said changes on a per change unit basis;

the instructions for the database management program including instructions for tracking for each instance of said storage platform, tracking the state of changes to the database management program for that instances, as well as the state of changes to a remote computer system for a plurality of other known instances in [[the]] a sync community; and

the instructions for the database management program including instructions for for synchronization, identifying new changes by comparing the enumerated changes to said data to the changes of the remote computer system for a particular instance with the state of changes for that instance.

25. (Previously presented): The computer-readable storage medium of claim 24, wherein the instructions for the database management program integrated with the file system are configured to execute during kernel mode of the operating system further comprising instructions whereby a first instance, a replica, is instantiated on a hardware/software interface system that directly supports Item-based synchronization and wherein a second instance, a data source, is instantiated on a hardware/software interface system that does not directly support Item-based synchronization, said method further comprising the use of an adapter to virtualize the second instance via a synchronization application programming interface.

26. (Previously presented): The computer-readable storage medium of claim 25, further comprising detecting synchronization conflicts at the level of change unit granularity.

27. (Previously presented): The computer-readable storage medium of claim 25, further comprising:

instances reporting success, failure, and/or conflicts at individual change unit level on change application, the instances comprising sync data; and
applications using sync data for updating a backend state.

28. (Previously presented): A computer-readable storage medium comprising computer readable instructions for synchronizing data ~~a replica with a data source, each being a sync partner, wherein both said replica and said data source have change state information that is maintained by each sync partner, and wherein said data source uses an adapter to interface with a hardware/software interface system of said replica,~~ said computer-readable storage medium instructions comprising:

instructions for executing an operating system that includes a kernel, the kernel including a file system integrated with a database management program;

the instructions for the kernel of the operating system including instructions for storing data in the file system as file streams;

the instructions for the kernel of the operating system including instructions for generating items associated with the file streams that include metadata for the file streams, wherein the metadata is defined by the schema for the data, further wherein the items

conform to a schema derived from a base schema, the schema defining a size of a change unit, further wherein a change unit is the smallest piece of schema that is individually tracked by the database management program integrated with the file system;

instructions for storing the items in the database management program;

instructions for an application program interface configured to expose an interface to a shell of the operating system, wherein the instructions for the application program interface include instructions for receiving said replica to send to said adapter an updated state information for [[said]] a remote computer system replica that, based on a last state information for said data source, reflect new changes that have been made to a change unit of an item since the last synchronization as reflected in said last state information for said data source, wherein data in the data source includes multiple types of data and each type of data conforms to a schema that defines a size of a change unit, the change unit being a smallest piece of schema that is individually tracked by the data store, and the size of each change unit in each schema is adjustable, such that said adapter, receiving said updated state information for said replica and said new changes, can

the instructions for the database management program including instructions for applying apply a conflict resolution policy selected from a plurality of conflict resolution policies;

the instructions for the kernel of the operating system including instructions for modifying the item in accordance with the new changes that have been made to the change unit of the item and a conflict resolution policy selected from the plurality;

the instructions for the kernel of the operating system including instructions for tracking can implement as many changes to the data source as possible with respect to the specified conflict resolution policy and track success or failure for each change on a change unit by change unit basis, wherein changes are sequentially enumerated and tracked on a per change unit basis[.];

the instructions for the kernel of the operating system including instructions for storing data that reflects the new changes in the file system as file streams.

29. (Currently amended): The computer-readable storage medium of claim 28,
further comprising:

~~instructions for transmitting changes to items to the remote computer system said hardware/software interface system of the replica storing said new state information for said data source for future use by said replica, provided that said adapter has calculated the new state of the data source based on the success or failure for each change on a change unit by change unit basis and has this new state information and transmitted this new state information to the hardware/software interface system of the replica.~~

30. (Currently amended): The computer-readable storage medium of claim 28,
further comprising:

~~wherein said adapter instructions for transmitting remote computer system transmits to the hardware/software interface system of the replica the success or failure for each change on a change unit by change unit basis, further comprising instructions for:~~

~~said hardware/software interface system of the replica to calculate a new state information for the data source based on the success or failure for each change to the data source on a change unit by change unit basis;~~

~~instructions for receiving said hardware/software interface system of the replica to transmit the new state information that reflects whether each change was successful from the remote computer system to the adapter and storing said new state information for future use by said replica, such that said adapter can receive and store said new state information; and~~
instructions for storing the new state information.